

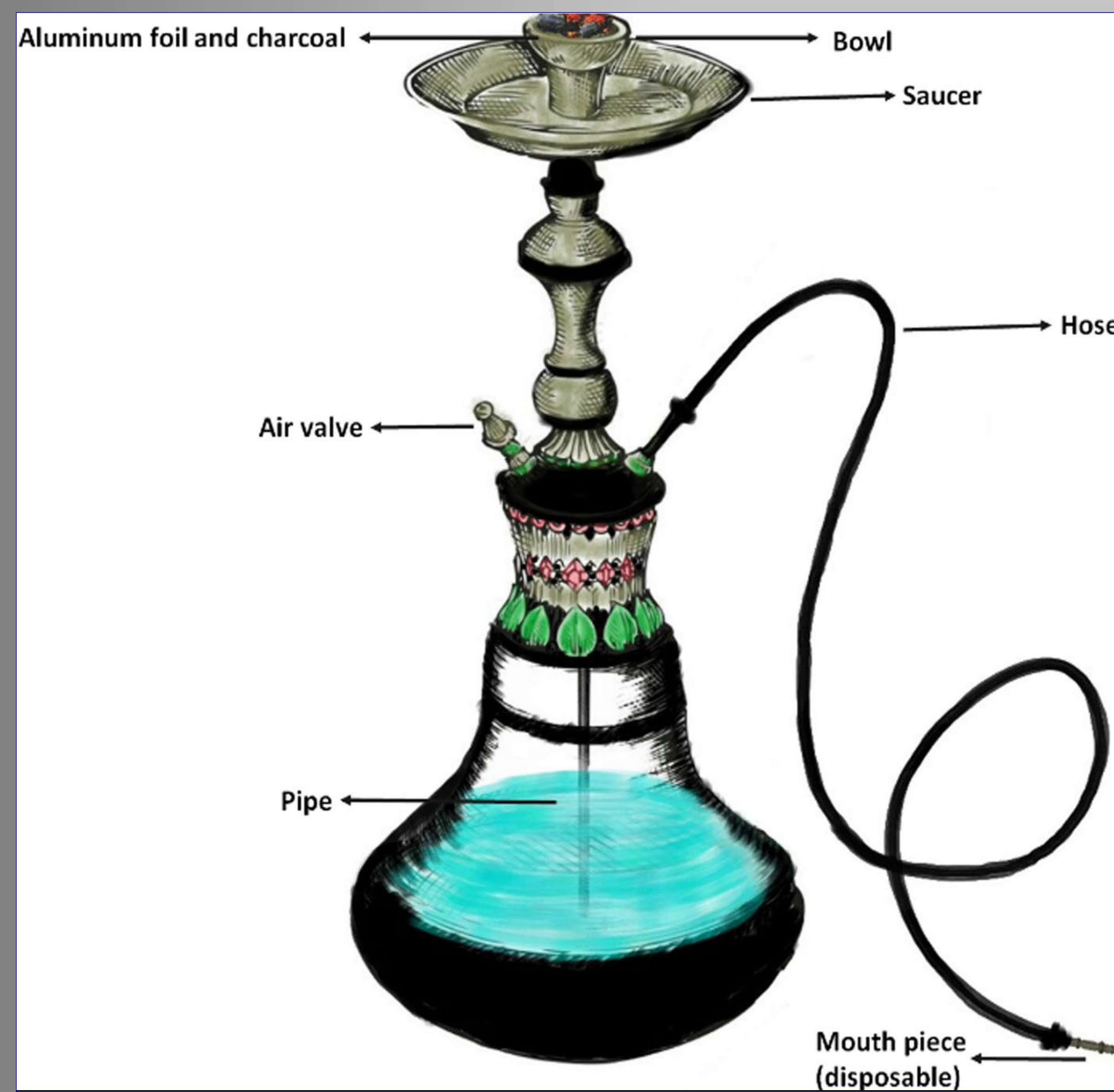
Hubbly Bubbly Hookah & Carbon Monoxide Toxicity

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INTRODUCTION

Hookah is a traditional method of tobacco use, where the user smokes tobacco through a mouthpiece via water pipe. It is most commonly practiced in the Middle East and Africa, and often considered to be a healthier option to smoking cigarettes. Hookah has become increasingly popular world-wide, especially in the younger population. In this case, we present a case of carbon monoxide (CO) toxicity after hookah use in an outdoor setting.



Hookah Apparatus

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CLINICAL COURSE

36-year-old male with no medical history presented from home after two syncopal episodes. The patient was outside smoking hookah with friends when he became lightheaded. He recalls getting up to go inside for a glass of water when he lost consciousness, hitting his head on a pole. He quickly regained consciousness, got up, and had another episode of syncope. Emergency Medical Services were called and per their initial evaluation: non-invasive Carbon monoxide (CO)-oximetry level was 26%. He was placed on a non-rebreather (NRB) at 15 liters per minute (LPM) for 30 minutes with no improvement of CO level. Initially the patient declined EMS transport but after speaking with poison control agreed to be transported to the Emergency Department (ED).

On arrival at the ED the patient was on 15 LPM NRB and well appearing. Vital signs were hemodynamically stable, his exam was notable for mild epigastric pain, with no nausea or vomiting. The patient also denied headache, chest pain, or difficulty breathing. Cranial nerves II through XII were grossly intact, strength was 5/5 and intact sensation in bilateral upper and lower extremities. He endorsed one alcoholic beverage and stated that no one else suffered from similar symptoms. Electrocardiogram was normal sinus rhythm with no ischemic change. Lab work notable for hemoglobin 15.5g/dL, hematocrit 46.1%, urea nitrogen 12 mg/dL, creatinine 1.04 mg/dL, lactic acid 1.7 mmol/L carboxyhemoglobin 14.6% and troponin 3 ng/L. Shortly after arrival to the ED the patients abdominal pain resolved and he felt at his baseline.

Hyperbaric oxygen therapy (HBOT) was recommended for this patient as a CO-oximetry level of 26% with two syncopal episodes and loss of consciousness is consistent with severe carbon monoxide poisoning. Patient declined and subsequently declined high-flow oxygen therapy and observation. Repeat exam continued to show no focal neurologic deficits (FND). Patient remained on 15L NRB for three hours prior to leaving the ED against medical advice.

Symptoms of CO Toxicity by Severity

Severity	Symptoms
Mild	Headache Chest pain with cardiac disease Shortness of breath Nausea/vomiting Blurry vision Fatigue Dizziness
Moderate	Severe headache Chest pain Disorientation Memory loss/confusion Syncope/loss of consciousness
Severe	Arrhythmia Cardiac Arrest Hypotension Seizures Apnea death

Indications for HBOT

- Any period of unconsciousness
- Severe Acidosis
- Age > 60
- COHb level > 40%
- Cardiovascular abnormalities
- Ischemic heart disease and COHb > 15%
- Pregnancy with COHb > 15%
- No response to 100% oxygen in 4 to 6 hours
- Recurrent symptoms > 3 weeks from exposure

DISCUSSION

CO toxicity should be considered in patients with vague symptoms after smoking hookah. These symptoms should include but are not limited to syncope, headache, difficulty breathing and FND.

Literature has shown that while hookah was once thought to be a healthier alternative, 60 minutes of hookah contains an eight-fold concentration of CO compared to a single cigarette, as well as higher concentrations of other toxins. Additionally, Hookah pipes use charcoal which can be attributed to the high levels of CO.

While the cause of syncope in this patient may be multifactorial, including dehydration, alcohol use and CO poisoning, HBOT was strongly indicated as severe CO toxicity could not be excluded as a cause of our patient's presentation. It is important to note that CO-oximetry of 26% and a carboxyhemoglobin level of 14.6% was in a well-ventilated, outdoor setting and after oxygen therapy, thus indicating that smoking hookah in open spaces does not decrease the risk of significant toxicity. Supplemental, high flow oxygen and HBOT should be considered especially when presenting symptoms indicate the possibility of severe toxicity even in the absence of FND as there is risk for delayed neurologic sequelae.

SUMMARY

- Hookah, while originally thought to be the healthy alternative to cigarette smoking, carries significant risk
- CO poisoning should be considered in patients with syncope, headache, difficulty breathing, and FND who have smoked hookah
- Hookah should be smoked in a well ventilated area, however this does not significantly decrease risk of CO toxicity
- Treatment of CO poisoning should include continuous oxygen, high flow, and HBOT for severe toxicity
- Patients are at risk for delayed neurologic sequelae of CO poisoning, which could occur > 40 days after exposure even if patient has come back to neurologic baseline